



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/723,242

11/26/2003

Matti S. Hamalainen

915-007.060

6033

4955

7590

03/21/2008

WARE FRESSOLA VAN DER SLUYS & ADOLPHSON, LLP  
BRADFORD GREEN, BUILDING 5  
755 MAIN STREET, P O BOX 224  
MONROE, CT 06468

EXAMINER

SHAH, PARAS D

ART UNIT

PAPER NUMBER

2626

MAIL DATE

DELIVERY MODE

03/21/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/723,242	<b>Applicant(s)</b> HAMALAINEN ET AL.	
	<b>Examiner</b> PARAS SHAH	<b>Art Unit</b> 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This communication is in response to the Amendments and Arguments filed on 01/14/2008. Claims 16 remain pending and have been examined. The Applicants' amendment and remarks have been carefully considered, but they do not place the claims in condition for allowance. Accordingly, this action has been made FINAL.
2. All previous objections and rejections directed to the Applicant's disclosure and claims not discussed in this Office Action have been withdrawn by the Examiner.

### ***Change of Examiners***

3. It should be noted that the Examiner for this Application has changed from Joel Stoffregen to Paras Shah.

### ***Response to Arguments***

4. Applicant's arguments (page 9) filed on 01/14/2008 with regard to claims 16 have been fully considered but they are moot in view of new grounds for rejection (see below itemized rejections).
5. Applicant's traversal of the restriction requirement has been carefully considered, but they are not persuasive and hence the Examiner's restriction requirement stands with claims 1-6 (Group I) being examined.

### ***Response to Amendment***

6. Applicants' amendments filed on 01/14/2008 have been fully considered. The newly amended limitations in claims 1, 3, and 6 necessitate new grounds of rejection. The same reference by Wiggins *et al.* was applied to teach the limitation of "wherein interdependence between said neighborhood frames is reflected together with other control information in a number of variables that constitute said internal state of said audio decoder".

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole, Patent No.: US 5,890,115 ("COLE"), in view of Wiggins, Jr. et al., Patent No.: 4,304,964 ("WIGGINS").

9. Regarding **claim 1**, COLE teaches a method for use in a wavetable based sound synthesis for which encoded wavetable data is encoded either independently or not with respect to neighborhood frames decoded by means of an audio decoder on a frame-by-frame basis ("the wavetable synthesizer 700 processes voices in frames", COLE, column 14, lines 41-42), each frame comprising at least one sample ("one sample period is called a frame", COLE, column 10, line 45), wherein said encoded wavetable data comprises samples in an attack section ("an attack stage", COLE, column 13, line

55) and samples in a loop section ("a sustain stage", COLE, column 13, line 55), which samples of said loop section may be reused for a playback in a loop as often as required ("loop through some range of data", COLE, column 18, line 19), said method comprising:

a) decoding consecutive frames of said wavetable data starting with a first frame up to a frame which includes a start of said loop section ("step directly through the stored data", COLE, column 18, lines 18-19); and

c) decoding subsequently all frames comprising samples of said loop section ("loop through some range of data", COLE, column 18, line 19) and providing said decoded frames for further processing for a playback ("playing back of digital files", COLE, column 18, line 30).

However, COLE does not disclose steps b) and d). In the same field of speech synthesis, WIGGINS teaches:

b) saving an internal state of said audio decoder before starting to decode said frame including the start of said loop section ("the K1-K10 coefficients previously inputted remain unchanged", WIGGINS, column 16, lines 20-21) wherein interdependence between said neighborhood frames (is reflected together with other control information in a number of variables that constitute said internal state of said audio decoder (see col. 15, lines 49-64 and col. 16, lines 18-20, pitch and energy parameter are being coded and when realized translate in control information to indicate a voice or unvoiced frame denoting a internal state change); and

d) at least if said samples of said loop section are distributed to more than one frame ("a repeat frame is used", WIGGINS, column 16, line 18), restoring said internal state of said audio decoder, saved at step b) ("the K1-K10 coefficients previously inputted remain unchanged", WIGGINS, column 16, lines 20-21).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to save speech parameters as taught by WIGGINS during the loop sections of COLE in order to reduce the data rate (WIGGINS, column 2, line 34).

10. Regarding **claim 2**, WIGGINS further teaches that each decoded frame is stored for said further processing by substituting a preceding frame in a storage component ("a repeat frame is used", WIGGINS, column 16, line 18), and wherein a respective next frame is only decoded at a time when samples of a further frame are needed (see WIGGINS, FIG. 6, decoding continues when a frame other than the "repeat frame" is sent).

11. Regarding **claim 3**, COLE teaches a device comprising:

an audio decoder for receiving wavetable data encoded either independently or not with respect to neighborhood frames for decoding said data on a frame-by-frame basis ("the wavetable synthesizer 700 processes voices in frames" COLE, column 14, lines 41-42, the wavetable data is received in frames constituting the first part of the limitations as the "or" (see col. 17, lines 60-67),), each frame comprising at least one

Art Unit: 2626

sample (“one sample period is called a frame”, COLE, column 10, line 45), wherein said encoded wavetable data may comprises samples in an attack section (“an attack stage”, COLE, column 13, line 55) and samples in a loop section (“a sustain stage”, COLE, column 13, line 55), which samples of said loop section are reusable for a playback in a loop as often as required (“loop through some range of data”, COLE, column 18, line 19);

a storage component for saving an internal state of said audio decoder (“register array 718”, COLE, column 18, line 3) wherein interdependence between said neighborhood frames (is reflected together with other control information in a number of variables that constitute said internal state of said audio decoder (see col. 15, lines 49-64 and col. 16, lines 18-20, pitch and energy parameter are being coded and when realized translate in control information to indicate a voice or unvoiced frame denoting a internal state change) ; and

a controller (“control logic 732”, COLE, column 18, lines 12-13), which controller causes said audio decoder to decode subsequently all frames comprising samples of said loop section (“loop through some range of data”, COLE, column 18, line 19) and to provide said decoded frames for further processing for a playback (“playing back of digital files”, COLE, column 18, line 30) ... and to repeat decoding subsequently all frames comprising said samples of said loop section (“loop through some range of data”, COLE, column 18, line 19).

However COLE does not disclose saving or restoring an internal state of the audio decoder. In the same field of speech synthesis, WIGGINS teaches saving an

internal state of an audio decoder into a storage component ("ROM 203", WIGGINS, column 16, line 51) before decoding a next frame ("the K1-K10 coefficients previously inputted remain unchanged", WIGGINS, column 16, lines 20-21), if said next frame includes a start of a loop section ("a repeat frame is used", WIGGINS, column 16, line 18), and restoring said internal state saved in said storage component ("the K1-K10 coefficients previously inputted remain unchanged", WIGGINS, column 16, lines 20-21).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to save speech parameters as taught by WIGGINS during the loop sections of COLE in order to reduce the data rate (WIGGINS, column 2, line 34).

12. Regarding **claim 4**, COLE further teaches a second storage component ("wavetable memory 610", COLE, column 18, lines 62-63) for storing the respective last decoded frame provided by said audio decoder ("a first sample ... addressed by the current synthesizer address register", COLE, column 18, lines 62-64) and for providing samples of a respectively stored frame for further processing for a playback ("playing back of digital files", COLE, column 18, line 30).

13. Regarding **claim 5**, COLE teaches a wavetable based sound synthesis system comprising:

an audio encoder for encoding a wavetable on a frame-by-frame basis either independently or not with respect to neighborhood frames for decoding said data on a

frame-by-frame basis (“the wavetable synthesizer 700 processes voices in frames” COLE, column 14, lines 41-42, the wavetable data is received in frames constituting the first part of the limitations as the “or” (see col. 17, lines 60-67), and for providing resulting wavetable data (“the wavetable synthesizer 700 processes voices in frames”, COLE, column 14, lines 41-42);

an audio decoder decoding received wavetable data on a frame-by-frame basis (“the wavetable synthesizer 700 processes voices in frames”, COLE, column 14, lines 41-42), each frame comprising at least one sample (“one sample period is called a frame”, COLE, column 10, line 45), wherein said encoded wavetable data may comprise samples in an attack section (“an attack stage”, COLE, column 13, line 55) and samples in a loop section (“a sustain stage”, COLE, column 13, line 55), which samples of said loop section may be reused for a playback in a loop as often as required (“loop through some range of data”, COLE, column 18, line 19);

a second storage component for saving an internal state of said audio decoder (“register array 718”, COLE, column 18, line 3) wherein interdependence between said neighborhood frames (is reflected together with other control information in a number of variables that constitute said internal state of said audio decoder (see col. 15, lines 49-64 and col. 16, lines 18-20, pitch and energy parameter are being coded and when realized translate in control information to indicate a voice or unvoiced frame denoting a internal state change); and; and

a controller (“control logic 732”, COLE, column 18, lines 12-13), which controller causes said audio decoder to decode subsequently all frames comprising samples of

said loop section ("loop through some range of data", COLE, column 18, line 19) and to provide said decoded frames for further processing for a playback ("playing back of digital files", COLE, column 18, line 30) ... and to repeat decoding subsequently all frames comprising said samples of said loop section ("loop through some range of data", COLE, column 18, line 19).

However COLE does not disclose saving or restoring an internal state of the audio decoder. In the same field of speech synthesis, WIGGINS teaches saving an internal state of an audio decoder into a storage component ("ROM 203", WIGGINS, column 16, line 51) before decoding a next frame ("the K1-K10 coefficients previously inputted remain unchanged", WIGGINS, column 16, lines 20-21), if said next frame includes a start of a loop section ("a repeat frame is used", WIGGINS, column 16, line 18), and restoring said internal state saved in said storage component ("the K1-K10 coefficients previously inputted remain unchanged", WIGGINS, column 16, lines 20-21).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to save speech parameters as taught by WIGGINS during the loop sections of COLE in order to reduce the data rate (WIGGINS, column 2, line 34).

14. Regarding **claim 6**, COLE teaches a software program product in which a software code for supporting a wavetable based sound synthesis is stored, for which wavetable based sound synthesis encoded wavetable data is decoded by means of an audio decoder decoding received wavetable data on a frame-by-frame basis ("the

Art Unit: 2626

wavetable synthesizer 700 processes voices in frames", COLE, column 14, lines 41-42) sample ("one sample period is called a frame", COLE, column 10, line 45), said encoded wavetable data encoded either independently or not with respect to neighborhood frames each frame comprising at least one (e.g. the wavetable data is received in frames constituting the first part of the limitations as the "or" (see col. 17, lines 60-67), wherein said encoded wavetable data may comprise samples in an attack section ("an attack stage", COLE, column 13, line 55) and samples in a loop section ("a sustain stage", COLE, column 13, line 55), which samples of said loop section may be reused for a playback in a loop as often as required ("loop through some range of data", COLE, column 18, line 19), said software code realizing the following steps when running in a processing component which is connected to said audio decoder:

causing said audio decoder to decode subsequently all frames comprising samples of said loop section ("loop through some range of data", COLE, column 18, line 19) and to provide said decoded frames for further processing for a playback ("playing back of digital files", COLE, column 18, line 30) ... and to repeat decoding subsequently all frames comprising said samples of said loop section ("loop through some range of data", COLE, column 18, line 19) wherein interdependence between said neighborhood frames (is reflected together with other control information in a number of variables that constitute said internal state of said audio decoder (see col. 15, lines 49-64 and col. 16, lines 18-20, pitch and energy parameter are being coded and when realized translate in control information to indicate a voice or unvoiced frame denoting a internal state change); and.

However COLE does not disclose saving or restoring an internal state of the audio decoder. In the same field of speech synthesis, WIGGINS teaches saving an internal state of an audio decoder into a storage component ("ROM 203", WIGGINS, column 16, line 51) before decoding a next frame ("the K1-K10 coefficients previously inputted remain unchanged", WIGGINS, column 16, lines 20-21), if said next frame includes a start of a loop section ("a repeat frame is used", WIGGINS, column 16, line 18), and restoring said internal state saved in said storage component ("the K1-K10 coefficients previously inputted remain unchanged", WIGGINS, column 16, lines 20-21).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to save speech parameters as taught by WIGGINS during the loop sections of COLE in order to reduce the data rate (WIGGINS, column 2, line 34).

### ***Conclusion***

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Takuji (US 5,886,277) is cited to disclose storage of information and decoding the resultant information. Hewitt (US 6,100,461) is cited to disclose wavetable cache for storing voice data and then synthesizing. Okazaki *et al.* (US 2004/0069118) is cited to disclose a compressed waveform data in plurality of frames. Hsieh (US 2004/02311497) is cited to disclose wavetable audio synthesis for synthesizing music based on data in memory. Tico *et al.* (US 2005/0080498) is cited to disclose wavetable sound synthesis selecting samples for output for next frame.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PARAS SHAH whose telephone number is (571)270-1650. The examiner can normally be reached on MON.-THURS. 7:00a.m.-4:00p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571)272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2626

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paras Shah/  
Examiner, Art Unit 2626

03/11/2008

/Patrick N. Edouard/  
Supervisory Patent Examiner, Art Unit 2626